SEQUENCE LISTING

<110> Jongsma, Maarten Anthonie
Stiekema, Willem Johannes
Bosch, Hendrik
Turk, Vito
Gruden, Kristina
Lenarcic, Brigita
Strukelj, Borut

<120> A Method for Plant Protection Against Insects or Nematodes

<130> 250308-1020

<140> 09/445,480
<141> 2000-07-07

<150> PCT/NL98/00352
<151> 1998-06-18

<160> 31

<170> PatentIn version 3.2

<210> 1
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<212> DNA
<213> Actinia equina

<300>
<301> Gruden, Kristina; Strukelj, Borut; Popovic, Tatjana; Lenarci
c,
Brigita; Bevec, Tadeja; Brzin, Joze; Kregar, Igor;
Herzog-Velikonja, Jana; Stiekema, Willem J; Bosch, Dirk
<302> The Cysteine Protease Activity of Colorado Potato Beetle
(Leptinotarsa decemlineata) Guts, Which is Insensitive to Po
tato
Protease Inhibitors, is Inhibited by Thyroglobulin Type -1
<303> Insect Biochem. Mol. Biol.
<304> 28
<306> 549-560
<307> 1998

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120

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180

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240

atggaaaaga gattctagga accaagatcc gtggatctcc ggattgcagc cgcagaaaag
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420

gagaatgcta ctgtgtggat aagaaaggaa aagaacttga aggcacaaga caacagggaa
480

ggccaacctg cgaaagacac ctaagcgaat gcgaggaagc tcgaatcaag gcgcattcaa
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600

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720

gctagtttcc agatcgaaaa taactacaaa ggattaataa aatgttaaaa taatttctca
780

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<210> 2
<211> 231
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<213> Actinia equina

<400> 2

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Ser Leu Thr Leu Cys Gly Gly Leu Gly Ala Ser Ala Ala Ser Gly Leu
        35                  40                  45

Ile Gly Thr Thr Val Pro Gly Cys Leu Gly Thr Gly Gly Pro Gly Gly
    50                  55                  60

Leu Gly Cys Thr Gly Ser Thr Gly Thr Cys Thr Cys Val Ala Gly Ala
65                  70                  75                  80

Gly Leu Gly Ile Leu Gly Thr Leu Ile Ala Gly Ser Pro Ala Cys Ser
                85                  90                  95

Ala Ala Leu Ala Ala Leu Thr Leu Cys Gly Met Met Gly Ala Ile Ile
            100                 105                 110

Val Ala Val Pro Gly Thr Cys Gly Pro Pro Ser Cys Leu Ala Ala Gly
        115                 120                 125

Ser Pro Ala Gly Val Gly Cys Cys Ala Ser Ala Gly Gly Cys Thr Cys
    130                 135                 140

Val Ala Leu Leu Gly Leu Gly Leu Gly Gly Thr Ala Gly Gly Gly Ala
145                 150                 155                 160

Pro Thr Cys Gly Ala His Leu Ser Gly Cys Gly Gly Ala Ala Ile Leu
                165                 170                 175

Ala His Ser Ala Ser Leu Ala Val Gly Met Pro Val Pro Gly Cys Leu
            180                 185                 190
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Cys Thr Cys Val Ala Gly Gly Gly Val Leu Val Pro Gly Ser Ala Val
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Ala Pro Leu Ala Pro Thr Cys
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120

caggcctcgg ctaacagtgg tctgataggt acttatgtac cacaatgcaa agaaactgga
180

gagtttgaag aaaagcaatg ctggggatcg actggttact gttggtgtgt ggatgaagat
240

ggaaaagaga ttctaggtac aaagatccgt ggatctccag actgcagtcg cagaaaagct
300

gccttaacac tttgccagat gatgcaagcc atcattgtga atgtccctgg ttggtgtgga
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cctccatcat gtaaagctga cggcagtttt gacgaggttc agtgctgcgc aagtaatgga
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gaatgctact gtgtggataa gaaaggaaaa gaacttgaag gcacaagaca acagggaagg
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ccaacctgcg aaagacacct aagcgaatgc gaggaggctc gtatcaaggc acattcaaac
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600

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Met Ile Thr Val Leu Pro Ile Ala Cys Ala Ile Thr Ser Thr Gly Ala
20 25 30

Ser Leu Thr Leu Cys Gly Gly Leu Gly Ala Ser Ala Ala Ser Gly Leu
35 40 45

Ile Gly Thr Thr Val Pro Gly Cys Leu Gly Thr Gly Gly Pro Gly Gly
50 55 60

Leu Gly Cys Thr Gly Ser Thr Gly Thr Cys Thr Cys Val Ala Gly Ala
65 70 75 80

Gly Leu Gly Ile Leu Gly Thr Leu Ile Ala Gly Ser Pro Ala Cys Ser
85 90 95

Ala Ala Leu Ala Ala Leu Thr Leu Cys Gly Met Met Gly Ala Ile Ile
100 105 110

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Val Ala Val Pro Gly Thr Cys Gly Pro Pro Ser Cys Leu Ala Ala Gly
        115                 120                 125

Ser Pro Ala Gly Val Gly Cys Cys Ala Ser Ala Gly Gly Cys Thr Cys
    130                 135                 140

Val Ala Leu Leu Gly Leu Gly Leu Gly Gly Thr Ala Gly Gly Gly Ala
145                 150                 155                 160

Pro Thr Cys Gly Ala His Leu Ser Gly Cys Gly Gly Ala Ala Ile Leu
                165                 170                 175

Ala His Ser Ala Ser Leu Ala Val Gly Met Pro Val Pro Gly Cys Leu
            180                 185                 190

Gly Ala Gly Ser Thr Ala Pro Val Gly Cys Thr Pro Ser Thr Gly Thr
        195                 200                 205

Cys Thr Cys Val Ala Gly Gly Gly Val Leu Val Pro Gly Ser Ala Val
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Ala Pro Leu Ala Pro Thr Cys
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<223> n = A, C, G, T

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<220>
<221> misc_feature
<222> (15)..(15)
<223> n = A, G

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<222> (18)..(18)
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<210> 6
<211> 21
<212> DNA
<213> artificial sequence

<220>
<223> primer

<220>
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<222> (4)..(4)
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<222> (10)..(10)
<223> n = A, C, G, T

<220>
<221> misc_feature
<222> (13)..(13)
<223> n = A, C, G, T

<220>
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<222> (16)..(16)
<223> n = T, C

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<222> (19)..(49)
<223> n = A, G

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<211> 48
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<223> conserved sequence

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<400> 7

Cys Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Xaa Pro Xaa Cys
1 5 10 15

Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa Xaa Gly Cys Xaa Xaa Xaa Xaa Xaa
20 25 30

Xaa Cys Thr Cys Val Xaa Xaa Xaa Gly Xaa Xaa Xaa Xaa Xaa Xaa Cys
35 40 45

<210> 8
<211> 7
<212> PRT
<213> artificial sequence

<220>
<223> synthetic substrate

<220>
<221> misc_feature
<222> (5)..(5)
<223> x=nitrophenylalanine

<400> 8

Pro Thr Gly Pro Xaa Ala Leu
1 5

<210> 9
<211> 30
<212> DNA
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<220>
<223> primer

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cgcgccatgg cgagtctaac caaatgccaa
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<220>
<223> primer

<400> 10
gggtgcggcc gcgcatgtgg ggcgtttaaa

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<210> 11
<211> 31
<212> DNA
<213> artificial sequence

<220>
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<400> 11
ggggggggaat tcctgacctc ttactaactc g
31

<210> 12
<211> 47
<212> DNA
<213> artificial sequence

<220>
<223> primer

<400> 12
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<210> 13
<211> 30
<212> DNA
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<400> 13
agatctgagc tctcgttcaa acatttggca
30

<210> 14
<211> 27
<212> DNA
<213> artificial sequence

<220>

<223> primer

<400> 14
aagcttgaat tcgatctagt aacatag
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<210> 15
<211> 24
<212> DNA
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<220>
<223> primer

<400> 15
ggggccatgg ctcttagcca aaac
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<210> 16
<211> 32
<212> DNA
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<220>
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<400> 16
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<210> 17
<211> 6
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<220>
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<400> 17

Gly Thr Cys Thr Cys Val
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<210> 18

<211> 65
<212> PRT
<213> Human Invariant Chain

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Leu Thr Lys Cys Gln Glu Glu Val Ser His Ile Pro Ala Val His Pro
1 5 10 15

Gly Ser Phe Arg Pro Lys Cys Asp Glu Asn Gly Asn Tyr Leu Pro Leu
20 25 30

Gln Cys Tyr Gly Ser Ile Gly Tyr Cys Trp Cys Val Phe Pro Asn Gly
35 40 45

Thr Glu Val Pro Asn Thr Arg Ser Arg Gly His His Asn Cys Ser Glu
50 55 60

Ser
65

<210> 19
<211> 67
<212> PRT
<213> rat invariant chain

<400> 19

Lys Val Leu Thr Lys Cys Gln Glu Glu Val Ser His Ile Pro Asp Val
1 5 10 15

His Pro Gly Ala Phe Arg Pro Lys Val Asp Glu Asn Gly Asn Tyr Met
20 25 30

Pro Leu Gln Cys His Gly Ser Thr Gly Tyr Cys Trp Cys Val Phe Pro
35 40 45

Asn Gly Thr Glu Val Pro His Thr Lys Ser Arg Gly Arg His Asn Cys
50 55 60

Ser Glu Pro
65

<210> 20
<211> 74
<212> PRT
<213> chum salmon egg inh.

<400> 20

His Val Pro Ile Asp Gly Ile Phe His Leu Lys Thr Pro Cys Glu Leu
1 5 10 15

Ala Arg Asp Ala Ala Thr His Gly Pro Ile Gly Gly Phe Ile Pro Thr
20 25 30

Cys Asp Tyr Asn Gly Gln Tyr Thr Pro Glu Gln Cys Trp Gly Ser Thr
35 40 45

Gly Tyr Cys Trp Cys Val Asn Ser Ser Gly Gln Lys Leu Pro Gly Thr
50 55 60

Asp Thr Pro Pro Gly Ser Ala Ser Asn Cys
65 70

<210> 21
<211> 69
<212> PRT
<213> Mouse Nidogen

<400> 21

Glu His Ile Leu Gly Ala Ala Gly Gly Ala Asp Ala Gln Arg Pro Thr
1 5 10 15

Leu Gln Gly Met Phe Val Pro Gln Cys Asp Glu Tyr Gly His Tyr Val
20 25 30

Pro Thr Gln Cys His His Ser Thr Gly Tyr Cys Trp Cys Val Asp Arg

35 40 45

Asp Gly Arg Glu Leu Glu Gly Ser Arg Thr Pro Pro Gly Met Arg Pro
50 55 60

Pro Cys Leu Ser Thr
65

<210> 22
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<212> PRT
<213> Human Epithelial Glycoprot

<400> 22

Gly Ser Lys Leu Gly Arg Arg Ala Lys Pro Glu Gly Ala Leu Gln Asn
1 5 10 15

Asn Asp Gly Leu Tyr Asp Pro Asp Cys Asp Glu Ser Gly Leu Phe Lys
20 25 30

Ala Lys Gln Cys Asn Gly Thr Ser Met Cys Trp Cys Val Asn Thr Ala
35 40 45

Gly Val Arg Arg Thr Asp Lys Asp Thr Glu Ile Thr Cys Ser Glu Arg
50 55 60

Val Arg Thr Tyr
65

<210> 23
<211> 65
<212> PRT
<213> Bull Frog Saxiphilin

<400> 23

Lys Cys Leu Lys Glu Arg Gln Val Ala Leu Gly Gly Asp Glu Lys Val
1 5 10 15

Leu Gly Arg Phe Val Pro Gln Cys Asp Glu Lys Gly Asn Tyr Glu Pro
20 25 30

Gln Gln Phe His Gly Ser Thr Gly Tyr Ser Trp Cys Val Asn Ala Ile
35 40 45

Gly Glu Glu Ile Ala Gly Thr Lys Thr Pro Pro Gly Lys Ile Pro Ala
50 55 60

Cys
65

<210> 24
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<212> PRT
<213> Thyroglobulin 1.1

<400> 24

Tyr Val Pro Gln Cys Ala Glu Asp Gly Ser Phe Gln Thr Val Gln Cys
1 5 10 15

Gln Asn Asp Gly Arg Ser Cys Trp Cys Val Gly Ala Asn Gly Ser Glu
20 25 30

Val Leu Gly Ser Arg Gln Pro Gly Arg Pro Val Ala Cys
35 40 45

<210> 25
<211> 45
<212> PRT
<213> Thyroglobulin 1.2

<400> 25

Tyr Leu Pro Gln Cys Gln Asp Ser Gly Asp Tyr Ala Pro Val Gln Cys
1 5 10 15

Asp Val Gln His Val Gln Cys Trp Cys Val Asp Ala Glu Gly Met Glu

20 25 30

Val Tyr Gly Thr Arg Gln Leu Gly Arg Pro Lys Arg Cys
35 40 45

<210> 26
<211> 43
<212> PRT
<213> Thyroglobulin 1.5

<400> 26

Phe Val Pro Ser Cys Thr Thr Glu Gly Ser Tyr Glu Asp Val Gln Cys
1 5 10 15

Phe Ser Gly Glu Cys Trp Cys Val Asn Ser Trp Gly Lys Glu Leu Pro
20 25 30

Gly Ser Arg Val Arg Asp Gly Gln Pro Arg Cys
35 40

<210> 27
<211> 44
<212> PRT
<213> Thyroglobulin 1.6

<400> 27

Phe Val Pro Ala Cys Thr Ser Glu Gly His Phe Leu Pro Val Gln Cys
1 5 10 15

Phe Asn Ser Glu Cys Tyr Cys Val Asp Ala Glu Gly Gln Ala Ile Pro
20 25 30

Gly Thr Arg Ser Ala Ile Gly Lys Pro Lys Lys Cys
35 40

<210> 28
<211> 70
<212> PRT

<213> Bovine Thyroglobulin

<400> 28

Gln Cys Pro Ser Leu Cys Glu Val Leu Gln Ser Gly Val Pro Ser Arg
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Arg Thr Ser Pro Gly Tyr Ser Pro Ala Cys Arg Ala Glu Asp Gly Gly
20 25 30

Phe Ser Pro Val Gln Cys Asp Pro Ala Gln Gly Ser Cys Trp Cys Val
35 40 45

Leu Gly Ser Gly Glu Glu Val Pro Gly Thr Arg Val Ala Gly Ser Gln
50 55 60

Pro Ala Cys Glu Ser Pro
65 70

<210> 29
<211> 80
<212> PRT
<213> Mouse Entactin

<400> 29

Lys Thr Arg Cys Gln Leu Glu Arg Glu His Ile Leu Gly Ala Ala Gly
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Gly Ala Asp Ala Gln Arg Pro Thr Leu Gln Gly Met Phe Val Pro Gln
20 25 30

Cys Asp Glu Tyr Gly His Tyr Val Pro Thr Gln Cys His His Ser Thr
35 40 45

Gly Tyr Cys Trp Cys Val Asp Arg Asp Gly Arg Glu Leu Glu Gly Ser
50 55 60

Arg Thr Pro Pro Gly Met Arg Pro Pro Cys Leu Ser Thr Val Ala Pro

65 70 75 80

<210> 30
<211> 82
<212> PRT
<213> Human IGF-Binding Protein-3

<400> 30

Tyr Gly Pro Cys Arg Arg Glu Met Glu Asp Thr Leu Asn His Leu Lys
1 5 10 15

Phe Leu Asn Val Leu Ser Pro Arg Gly Val His Ile Pro Asn Cys Asp
20 25 30

Lys Lys Gly Phe Tyr Lys Lys Lys Gln Cys Arg Pro Ser Lys Gly Arg
35 40 45

Lys Arg Gly Phe Cys Trp Cys Val Asp Lys Tyr Gly Gln Pro Leu Pro
50 55 60

Gly Tyr Thr Thr Lys Gly Lys Glu Asp Val His Cys Tyr Ser Met Gln
65 70 75 80

Ser Lys

<210> 31
<211> 77
<212> PRT
<213> Human Testican

<400> 31

Gln Lys Pro Gly Gly Leu Pro Cys Gln Asn Glu Met Asn Arg Ile Gly
1 5 10 15

Lys Leu Ser Lys Gly Lys Ser Leu Leu Gly Ala Phe Ile Pro Arg Cys
20 25 30

Asn Glu Glu Gly Tyr Tyr Lys Ala Thr Gln Cys His Gly Ser Thr Gly
35 40 45

Gln Cys Trp Cys Val Asp Lys Tyr Gly Asn Glu Leu Ala Gly Ser Arg
50 55 60

Lys Gln Gly Ala Val Ser Cys Glu Glu Glu Gln Glu Thr
65 70 75